

ABSTRACT

Copper seed layers for use in damascene structures are commonly deposited by CVD because of their superior step coverage. However, these films have poor adhesion to the barrier layer. This problem has been overcome by preceding the deposition of the CVD copper layer with a metal plasma treatment that lays down a very thin layer of copper while the structure receiving it is maintained at a temperature below about -40 C. This is followed by a short exposure to a nitrogen bearing plasma. The result is a seed layer having excellent step coverage as well as very good adhesion to the underlying barrier layer.